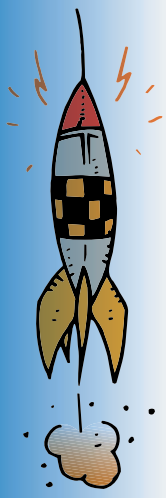
Volume 5
Issue 4

Space Nutrition

Going for a spin...



When leaving Earth's gravity, the body begins to adapt to a new environment, one where less muscle and bone are required to help you stand or move around, where the heart doesn't have to pump as hard to get blood to your fingers and toes, and where movement up and down can change with a small push off the spacecraft floor (or wall, or ceiling...).

The body changes itself to adapt to the new environment. Some of these changes can be hazardous to the health of astronauts during their mission or even after they return to Earth (or land on the Moon or Mars), where gravity is much greater. One possible way to minimize the effects of gravity on the body is through a process called "artificial gravity." This means creating gravity.

We are starting a bed rest study (an analog of space flight) where we will create gravity by using a centrifuge, a device that will spin people in a way that will make them feel like they are standing up (even though they will be lying down at the time). This is much like amusement park rides that spin and make you feel like you are stuck to the wall. The bed rest experiment will have people stay in bed for 21 days, and either do nothing (one group of subjects), or be centrifuged for one hour every day (like Thea and Diego in the picture below). We will study their bones, muscles, and other body systems to see if the spinning helps to reduce the negative effects of bed rest. If it does, someday a similar artificial gravity device may be flown in space, or we may even spin the spacecraft (very carefully) to create gravity inside for the space explorers.

Thea's Corner...

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Across

1 Crew member
7 Planet closest to Earth
10 A first letter of a name
11 Instructor
12 Rocket Science
13 What to do when you're hungry
14 Enjoyable
15 Saturn V _____
18 Mission Integration
19 Vehicles that fly
20 Used to create "artificial gravity" during bed rest
23 A Dalmatian has lots of these
24 Not dry
25 Associated with the moon
28 Biology, physics, chemistry
30 Path taken by the Earth around the sun
31 To cut something in half; banana ____
32 A case where a rule does not apply
36 A fruit that can be red, green, or yellow
38 To consent to; 18th President of the United States, Ulysses
40 Moisture falling from the sky
42 You have 2 of these on the sides of your head
44 Regular, usual
45 The Hard Upper Torso of a spacesuit
46 A developed ability

Down

1 _____ gravity; fake
2 Practice; astronauts undergo thousands of hours of this before a mission
3 To walk, you put one foot in front of the _____.
4 What we breathe
5 A contest that ends with equal score
6 To put back together
7 What we would call beings on Mars
8 Advanced Life Support
9 ISS
13 Search, discover new lands
16 NASA scientists use this to monitor muscle performance (electromyography)
17 Something used to fasten things together (plural)
21 Substance in a pen that allows you to write
22 Urine Monitoring System
24 Us
26 Not lower
27 To turn around an axis
28 To direct, turn; the wheel in your car allows you to do this
29 Cat___
33 Penny, nickel, dime, quarter
34 2 groups who compete in a contest
35 Mix between a circle and a rectangle
37 Playground, place to walk the dog
39 Van Gogh's hobby
41 Not later, but ___
43 Air Speed

Did You Know?

- Bed rest is a good analog of space flight for studying the effects of microgravity on bone, muscle, and the heart (see Issue 2 of the Space Nutrition Newsletter for more details about bed rest studies).
- Astronauts experience a sunrise every 90 minutes when they are in space.
- Each Space Shuttle astronaut is allotted 3.8 pounds of food per day (including one pound of packaging). Foods are individually packaged and stowed for easy handling in the zero gravity of space.

Word of the Month

polar

Can you guess what this word means? Look it up in the dictionary and see if you were right. We'll have more on this next month!

Web Challenge: Find pictures of the Artificial Gravity study centrifuge, and find out what's happening at the Kids Science News Network in the links below....

http://www.nasa.gov/mission_pages/exploration/spacecraft/
http://www.nasa.gov/audience/forstudents/5-8/features/F_KSNN.html
http://www.nasa.gov/vision/space/preparingtravel/human_centrifuge_images.html
http://ksnn.larc.nasa.gov/intro.htm
http://imagine.gsfc.nasa.gov/docs/ask_astro/answers/980204c.html

Check out Thea's Bonus Page, experiments you can try, and even stuff you may have done at our website:
http://haco.jsc.nasa.gov/resources/kid_zone.htm
email: Space.Nutrition.Newsletter@nasa.gov